DESKTOP COMPUTER WITH ADJUSTABLE FLAT PANEL SCREEN

This application is a continuation-in-part of application Ser. No. 08/084,011, filed Jun. 29, 1993, now abandoned.

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to desktop or portable computers with flat panel displays. In particular it relates to personal computers that will lie on a desk or table, which a human operator will use to: (1) enter keyboard data, pen or voice data/information; (2) view displayed information and/or (3) hear audio/voice information.

2. Description of the Prior Art

Heretofore, portable computers with flat panel displays were embodied in a "clamshell" type design. When these prior art computers are ready for use, the display panel is unfolded to a roughly vertical orientation. The attached keyboard and computer enclosure form the bottom half of the clamshell. For portable transport, the flat panel display is folded down over the keyboard and computer enclosure. This prior art configuration has several shortcomings. First, since the unit sits on a desk or table, the screen is always at a lower elevation than the eye level of the person sitting and operating the computer. Thus the person must continually look down to the display. Over long periods of time, this will cause neck and back strain on the user. Secondly, if a pen/stylus input means is added to the display screen, the roughly vertical operating orientation is inconvenient and ergonomically incorrect when the user is handwriting or sketching. If the user tries to hold his/her arm up to write on a vertical screen, the users arm will tire. Over long periods of writing on a vertical screen, this awkward position will cause strain on one's wrist. Even if the user is willing to hold his/her hand up to write on the vertical screen, it may not be physically secure for the user's hand pressure. Thirdly, the prior art clamshell design does not provide elevation adjustment or azimuth angle adjustment means. This restricts the ergonomic usability of the prior art computer and display units.

For example, U.S. Pat. No. 4,859,092 of Makita discloses a portable typewriter and display unit. However, a single pair of pivoting arms connect the display unit to the main body. When its display unit is raised to its highest elevation, the distance from the user's eyes to the display screen is large. Therefore, middle aged users who are near sighted, will have difficulty in viewing the screen. No pen/stylus input mean is disclosed, but even if one is added, the display unit would not provide a physically secure writing surface. The Makita does not provide a means of placing equal and opposite restraining force onto the display unit. U.S. Pat. No. 4,624,434 of Lake discloses a tiltable display terminal, but no display unit elevation adjustment is taught. Again no pen input means is disclosed, and if one is added, the unit would not be physically stable for normal hand/arm forces applied by the user. U.S. Pat. No. 5,115,374 of Hongoh teaches a laptop portable computer with a facsimile function. Hongoh discloses a touch panel screen, but no pen input means, and no vertical elevation adjustment of its display unit is taught. In order to provide a horizontal display orientation, the display unit must be detached from the main body and set back, in reverse orientation, to the connector sockets on the main body, which is a severe disadvantage.

Several prior art pen computer units exit. However, their display screens are fixed to their enclosure to form a flat tablet. They are designed for the mobile user market. This limits their use for desktop pen/stylus computing environments. No prior art has solved the problem of a personal computer for the office environment, capable of standard computing, pen computing, and voice telephone communications.

The invention disclosed herein solves the above problems by providing an ergonomic designed desktop system that is capable of several important computer and communications functions. It provides a display panel assembly, pen/stylus input unit, multiple support arms, and a main unit in a roughly wedge shape. The display panel assembly can be adjusted in inclination angle, azimuth angle and elevation. Thus invention overcomes the problems of the prior art. For example, the display panel of the invention can be easily adjusted by hand in elevation to a height roughly of the user's eye level. The user does not have to look down to see the screen when in normal PC-keyboard operation. If the unit is used as a pen/stylus computer, the display panel can be folded by hand to a physically secure position, at an inclination angle that is ergonomically correct for handwriting and sketching. Finally, the display screen can be physically adjusted in many orientation combinations, including azimuth angles, inclination angles and elevation translations. Thus the invention can be used in a wide range on office desktop positions and by a wide range of users and orientations.

SUMMARY OF THE INVENTION

The disclosed invention overcomes the shortcomings of the prior art by providing display screen adjusting means for desktop computers and terminals, such that the entire apparatus is sufficiently small to be portable or transportable. The invention disclosed herein provides an easy to use desktop workstation, to which the human user can adjust its screen for many screen positions. In addition, the workstation can fold down for transport. The workstation may also include external communication means such as voice/data modem and/or telephone means.

Accordingly an object of the invention is to provide small compact workstation for the office, having an array of useful functions and capabilities at the finger tips of the human user sitting at his/her desk. Functions may include pen/stylus input means, computer means, display device(s), mass memory devices, keyboard, mouse, speaker phone, network interface and modem.

Another object of the invention is to give the user a voice and data communications capability at the desktop, capable of standard text/graphics computing, as well as voice/video/pen communication to others individuals or computers, via modem or network (LAN/WAN) interfaces.

Still another object of invention is to provide the user with an ergonomic workstation that can be adjusted to a wide range of positions and orientations, such that there will be a reduction or elimination of body stress and fatigue by the user, over long periods of use.

Still another object of the invention is to provide a modular desktop workstation such that the user can configure the workstation to how he/she works, or to their choice at a particular time. For example, the user will have the choice of using a detached keyboard, pen/stylus input, mouse, trackball, handset telephone, or speaker telephone, depending on his/her wishes for accomplishing a particular task.

Still another object of the invention is to provide a unit that is small and light enough for the user to easily transport